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May 19, 2004

002-10287-00

Mr. Albert M. Cohen, Esq.
Smiland & Khachigian
601 West Fifth Street, Seventh Floor
Los Angeles, California 90071

Subject: Response to United States Environmental Protection Agency
Conceptual Remedial Action Cost Estimate for the Omega Chemical Superfund Site,
Whittier, California

Dear Mr. Cohen:

As requested, LFR Levine·Fricke (LFR) has prepared this letter to comment on the United States Environmental Protection Agency's (USEPA) conceptual remedial action cost estimate for the Omega Chemical Superfund Site in Whittier, California. These comments are based on LFR's review of the Technical Memorandum prepared by CH2MHill entitled "Conceptual Cost Estimate for Site-Wide Remedial Action, Omega Chemical Superfund Site" and dated April 6, 2004.

In general, LFR believes that the costs presented in CH2MHill's memorandum are based on incorrect and "worst case" assumptions regarding the nature and extent of contamination originating from the Omega Site, and unrealistic assumptions regarding remedial technologies and associated costs. In fact, EPA's Guidance Document entitled "Superfund Program; Early De Minimis Waste Contributor Settlements" dated July 1, 1992, states that:"A Region should use available site and cost information to develop a best estimate of future response costs for the de minimis settlement." This estimate should be based on reasonable judgment and generate a "best estimate" not "worst case" cost estimate.

For example, CH2MHill assumes that the groundwater plume emanating from the Omega Site is 2.5 miles long, 0.75 mile wide, and 50 feet thick, and uses these assumptions to calculate a volume of impacted groundwater attributable to the Omega Site and develop the costs for remediation of the groundwater. This then leads to CH2MHill's assertion that pumping at 1,900 gallons per minute (gpm) would be required to address this area of impacted groundwater. However, the actual extent of groundwater contamination that may have emanated from the Omega Site and the associated remedial costs that may be needed to address this contamination appear to be dramatically less than assumed by CH2MHill.

LFR's specific concerns regarding the USEPA's Conceptual Costs are presented below.

Extent of Contamination

Studies by USEPA's own contractor, Weston Solutions (Weston), have documented the presence of multiple additional sources of groundwater contamination in the area of and downgradient from the Omega Site. These previously undocumented sources and many other known sources of contamination in the area have released the same primary chemicals found at the Omega Site, such as tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), 1,1-DCE, and Freon compounds. Releases from these additional downgradient sources have resulted in multiple plumes of groundwater contamination that are not attributable to the Omega Site. The extent of the plume of groundwater contamination possibly originating from the Omega Site is much less than 2.5 miles long and 0.75 mile wide.

The additional "hot spot" sources of groundwater contamination identified by Weston ("Phase 2 Groundwater Characterization Study"; June 2003) include the following:

1. The area north of Baldwin Place, more than 1,200 feet northwest of the Omega Site, where TCE has been found at concentrations as high as 960 micrograms per liter (µg/l). TCE, PCE, and other volatile organic compounds (VOCs) from this location have migrated toward the southwest, resulting in a plume that is much wider than that which would be attributable solely to the Omega Site.

2. The area near B-103, approximately 1,000 feet west of the Omega Site, where TCE in groundwater (as high as 7,000 µg/l) exceeds that found at the Omega Site, and also migrates toward the southwest. The presence of elevated concentrations of chromium (greater than 60 µg/l) in groundwater from well MW-6A is also indicative of a separate source in the area. Elevated chromium concentrations are not found at the Omega Site.

3. The area near PP078, PP006, and B101, west and northwest of the Omega Site, where higher PCE levels range from 1,100 to 2,100 µg/l.

4. The area near the intersection of Byron and Rivera Roads, approximately 2,300 to 2,600 feet west-southwest of the Omega Site. A "hot spot" of PCE was found in this area with concentrations as high as 5,100 µg/l.

5. The area near Rivera Road and Secura Way, where PCE has been found at levels up to 580 µg/l.

6. The area along Dice Road, north of Los Nietos Road, approximately 5,000 feet southwest of the Omega Site, where elevated concentrations of several VOCs have been found in groundwater migrating toward the south and southwest. These VOCs include PCE (3,300 µg/l),

TCE (780 µg/l), cis-1,2-DCE (1,400 µg/l), 1,1-DCE (2,900 µg/l), Freon-11 (61 µg/l), and Freon-113 (61 µg/l).

The same Weston report also indicates that: "Other active sites with known chlorinated hydrocarbon contamination in groundwater are present within the OU-2 study area, particularly beyond one mile from the Omega site. Many of these sites are administered under programs of the Regional Water Quality Control Board and the California Department of Toxic Substances Control" (Weston Solutions, June 2003).

The presence of these additional sites has resulted in the formation of multiple overlapping plumes of PCE, TCE, DCE, and other contaminants, and the migration of those contaminant plumes in the area southwest of and apparently downgradient from the Omega Site. The concentrations of VOCs in the vicinity of some of these additional sources are also similar to or higher than those found in groundwater at the Omega Site. As a result, these (and other) additional sources have greatly increased the area and volume of groundwater contamination beyond that which may have originated from the Omega Site.

As also noted by Weston, there are "many" sites in the OU-2 study area that are being administered by the Regional Water Quality Control Board (RWQCB) and Department of Toxic Substances Control (DTSC), and it is likely that additional investigations have been conducted at those sites to document the impacts of these additional sources. It is also likely that decisions regarding the need for groundwater remediation, possibly including groundwater extraction and treatment, have been or will be made by those agencies. Therefore, it is not reasonable to conclude at this time that groundwater extraction and treatment will be required, or is even warranted, throughout the large area assumed by CH2Mhill.

As a result, it is not appropriate to conclude that the extent of groundwater contamination originating from the Omega Site is 2.5 miles by 0.75 mile, and in fact the actual extent of the Omega Site plume is likely only a fraction of that size. Therefore, the scope of possible groundwater remedial actions assumed by CH2MHill and the resulting costs would also be dramatically reduced if they are intended to address only that contamination which may have originated from the Omega Site. If groundwater extraction and treatment were to be implemented, the scope and costs of that remedial technology would be directly related to the size and depth of the area of impacted groundwater. If the area of impacted groundwater possibly originating from the Omega Site is four or five times less than that assumed by CH2MHill, this would reduce costs accordingly.

Groundwater Treatment Alternatives

In their cost calculations, CH2MHill has assumed that multiple treatment technologies will be required to treat groundwater, resulting in an overly complex and expensive treatment system. The proposed technologies include: air-stripping to remove VOCs, advanced oxidation process (AOP) to remove 1,4-dioxane and VOCs, liquid-phase granular activated carbon (LGAC) to remove

VOCs, biological treatment (fluidized bed reactor) to address perchlorate, and pH adjustment to remove hexavalent chromium. It is highly unlikely that such a complex series of treatment alternatives operating would be used because of the difficulty in implementation and excessive costs. Often, use of lower order treatment systems grouped in series can be more cost-effective than progressing to a higher order technology. A more in-depth evaluation of treatment alternatives and pilot testing is necessary before meaningful costs can be developed.

Some contaminants in groundwater, such as chromium and perchlorate, have not been shown to be associated with the Omega Site. The highest concentrations of chromium (90 to 100 µg/l) are found over 1,000 feet from the Omega Site in the area of an additional source of VOCs, and very few monitoring wells have been found to contain chromium above its drinking water maximum contaminant level (MCL; 50 µg/l). Based on groundwater monitoring data, it is unlikely that chromium concentrations in groundwater will necessitate treatment.

Perchlorate has been found only slightly above its California Department of Health Services (DHS) Action Level of 6 µg/l in one monitoring well (6.2 µg/l in MW-07) located upgradient of the Omega Site. All other groundwater samples collected in the third quarter 2003 sampling event were below the DHS Action Level for perchlorate. It is unreasonable, therefore, to assume that groundwater treatment would be required for perchlorate, particularly as CH2MHill has assumed would be required for the entire 1,900-gpm treatment system.

More importantly, experience at other similar sites and monitoring data from the Omega Site area indicate that not all of these technologies will be required to treat groundwater. As indicated, it is not likely that treatment will be required for chromium or perchlorate. This would have a dramatic impact on costs, as the capital and operations and maintenance (O&M) costs alone for perchlorate removal are very high. Additionally, even if groundwater extraction and treatment were implemented, it is unlikely that air stripping, AOP, and LGAC would all be required. More likely, some reduced combination of these technologies would be used to efficiently treat the water.

CH2MHill appears to assume that a system comprised of all of these treatment technologies will be required to process 1,900-gpm for at least 30 years. Furthermore, they indicate that they used "average contaminant levels" and that "There has been no effort to account for the change in contaminant concentrations with time,..." In addition, CH2MHill appears to assume that groundwater sampling and treatment system O&M activities will not change with time.

While CH2MHill does not provide the data upon which they relied to determine "average contaminant levels," it is generally known that contaminant concentrations do not remain constant with time during remediation. In fact, it is expected that groundwater concentrations should decrease with time if the remedial system is correctly designed and implemented. Such expected decreases in groundwater contaminant concentrations would translate directly to reduced variable costs such as carbon consumption, electricity, and treatment chemicals. Similarly, costs for groundwater monitoring are also known to generally decrease with time.

Remedial Cost Estimates

The uncertainty included in the cost estimate presented by CH2MHill is excessive. In the Limitations section of the subject document, CH2MHill indicates that "The conceptual cost estimates prepared for the groundwater extraction and treatment for the Omega Site are based on gross assumptions regarding the nature and extent of contamination, and possible RA scenarios." They also note that "The RI at the Omega site is ongoing..." and "the FS had not yet been initiated." As a result, CH2MHill concluded "the actual remedial costs for the Omega site will be different than the estimate presented herein, possibly by more than an order of magnitude."

An evaluation of the sample of historical Superfund costs shown in Attachment B-1 of the Technical Memorandum indicates that, on average, both the capital and O&M costs estimated for the Omega Site are significantly higher than the highest costs included in the Attachment. Although CH2MHill did correct for a flow rate increase (see Attachment A-3), the average annual flow rate used for the comparison was only 120,000,000 gallons (228 gpm at 100% uptime). This is reportedly the average flow rate compiled from 32 groundwater treatment systems that either have operated or are currently operating at Superfund sites. Given that the average groundwater flow rate at the Superfund sites is only 228 gpm, CH2MHill's proposed flow rate of 998,640,000 gallons per year or 1,900 gpm is unrealistic and inconsistent with flow rate data from other Superfund sites and from other groundwater remediation sites in the Los Angeles area. In sum, the flow rates are greatly exaggerated and, therefore, the estimated remediation costs are greatly exaggerated.

A more practical strategy would be to develop realistic cost estimates and use insurance products to manage the risk inherent in environmental cleanup projects. Insurance is generally available to cover possible remedial cost overruns that may be caused by changing regulatory conditions, discovery of more of the same or new contaminants, inflation, and other factors.

In addition to the already conservative criteria used to develop their cost estimate, which include assumptions of unrealistic plume size, pumping rates, and treatment technologies, CH2MHill also applies very high cost contingency factors. They apply a Cost Basis Contingency (20%) and a Concept Scope Contingency (20%) to the total capital cost for groundwater extraction and treatment. This increased the total capital cost by approximately $7.5 million.

As mentioned previously, perchlorate above DHS levels was detected in only one monitoring well located upgradient from the Omega Site. It is unlikely that such low perchlorate levels would require a separate treatment unit as specified by CH2MHill. Eliminating the biological fluidized bed treatment system and the ancillary tanks, pumps, and metering systems will reduce the groundwater treatment capital costs by approximately $2.4 million and annual O&M costs by an estimated $200,000 to $300,000.

The presence of elevated concentrations of chromium (greater than 50 µg/l) in groundwater are not found at the Omega Site. As a result, it should not be necessary to treat groundwater from the site

for chromium. Subtracting the capital and annual O&M costs directly attributed to chromium treatment would reduce the overall costs by $170,000 and $255,000, respectively.

CH2MHill assumed that multiple treatment technologies would be required to treat the entire groundwater plume. By reducing the size and number of treatment methods to address only that contamination which may have originated from the Omega Site, significant cost savings can be realized. Treatment technologies should be simplified and based on a combination of LGAC and air stripping followed by advanced oxidation, or air stripping followed by LGAC. CH2MHill's assumed that advanced oxidation would be necessary to treat 1,4 dioxane; however, there is not sufficient data to determine, if in fact, such treatment would be required. Eliminating advanced oxidation from the cost estimate would reduce groundwater treatment capital costs by nearly $1 million and annual O&M costs by more than $300,000.

If you have any questions regarding the contents of this letter, please do not hesitate to contact the undersigned at (510) 596-9511.

Sincerely,

Thomas M. Johnson, R.G., C.H.G.
Senior Principal Hydrogeologist